

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) An image processing system comprising:

sensing means for sensing a projection area on which an image is projected and outputting sensing information;

histogram generation means for generating histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on the sensing information;

direction determination means for generating direction information, based on an angle between a normal direction orthogonal to the projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and

keystone distortion correction means for correcting keystone distortion of the projected image, based on the histogram information and the direction information.

2. (Original) The image processing system as defined in claim 1, comprising:

a portable device having the sensing means, the histogram generation means, and the direction determination means; and

an image display device having the keystone distortion correction means and projection means for projecting an image,

wherein the keystone distortion correction means includes:

vertical keystone distortion correction means having inclination detection means for detecting the inclination of the image display device, for correcting keystone distortion in the vertical direction; and

horizontal keystone distortion correction means for correcting keystone distortion in the horizontal direction, based on the histogram information and the direction information.

3. (Currently Amended) An image processing system comprising:

a projection section which projects an image into a projection area;

light projection means for projecting light of a distortion-free and predetermined shape from a virtual view position into ~~a~~ the projection area;

sensing means for outputting sensing information obtained by sensing the projection area into which the light of the predetermined shape is projected, from a projection position of ~~a~~ the projection ~~section for projecting an image;~~ section;

area extraction means for extracting coordinates of the light of the predetermined shape in a sensed area, based on the sensing information; and

keystone distortion correction means for converting the coordinates of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into the projection coordinates.

4. (Original) The image processing system as defined in claim 3, wherein:

the predetermined shape is rectangular or square;

the area extraction means extracts coordinates of four corners of the light of the predetermined shape; and

the keystone distortion correction means converts the coordinates of the four corners of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and corrects keystone distortion by mapping the coordinates of an input image into an area formed by the projection coordinates of the four corners.

5. (Original) The image processing system as defined in claim 3, comprising:
a portable device having the light projection means; and
an image display device having the sensing means, the keystone distortion correction means, and the projection section.
6. (Original) A projector comprising:
projection means for projecting an image;
receiving means for receiving histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on sensing information obtained by sensing a projection area on which the projected image is projected, and direction information based on an angle between a normal direction orthogonal to a projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and
keystone distortion correction means for correcting keystone distortion of the projected image, based on the histogram information and the direction information.
7. (Original) The projector as defined in claim 6,
wherein the keystone distortion correction means includes:
vertical keystone distortion correction means having inclination detection means for detecting the inclination of the projection means, for correcting keystone distortion in the vertical direction; and
horizontal keystone distortion correction means for correcting keystone distortion in the horizontal direction, based on the histogram information and the direction information.
8. (Currently Amended) A projector comprising:
a projection section which projects an image into a projection area;

sensing means for outputting sensing information obtained by sensing a projection area into which light of a distortion-free and predetermined shape is projected from a virtual view position, from a projection position of a the projection section ~~for projecting an image; section;~~

area extraction means for extracting coordinates of the light of the predetermined shape in a sensed area, based on the sensing information; and

keystone distortion correction means for converting the coordinates of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into the projection ~~coordinates; and~~ coordinates.

~~the projection section.~~

9. (Original) The projector as defined in claim 8, wherein:

the predetermined shape is rectangular or square;

the area extraction means extracts coordinates of four corners of the light of the predetermined shape; and

the keystone distortion correction means converts the coordinates of the four corners of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and corrects keystone distortion by mapping the coordinates of an input image into an area formed by the projection coordinates of the four corners.

10. (Original) A portable device comprising:

sensing means for sensing a projection area on which an image is projected;

histogram generation means for generating histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on sensing information obtained by the sensing means;

direction determination means for determining direction information based on an angle between a normal direction orthogonal to the projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and

transmitter means for correcting keystone distortion of the projected image, based on the histogram information and the direction information, and transmitting the histogram information and the direction information to an image display device that projects the projected image.

11. (Original) An image processing system comprising:

a sensing section which senses a projection area on which an image is projected and outputting sensing information;

a histogram generation section which generates histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on the sensing information;

a direction determination section which generates direction information, based on an angle between a normal direction orthogonal to the projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and

a keystone distortion correction section which corrects keystone distortion of the projected image, based on the histogram information and the direction information.

12. (Currently Amended) An image processing system comprising:

a projection section which projects an image into a projection area;

a light projection section which projects light of a distortion-free and predetermined shape from a virtual view position into a the projection area;

a sensing section which outputs sensing information obtained by sensing the projection area into which the light of the predetermined shape is projected, from a projection position of ~~a-the projection section for projecting an image;~~section;

an area extraction section which extracts coordinates of the light of the predetermined shape in a sensed area, based on the sensing information; and

a keystone distortion correction section which converts the coordinates of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into the projection coordinates.

13. (Original) A projector comprising:

a projection section which projects an image;

a receiver section which receives histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on sensing information obtained by sensing a projection area on which the projected image is projected, and direction information based on an angle between a normal direction orthogonal to a projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and

a keystone distortion correction section which corrects keystone distortion of the projected image, based on the histogram information and the direction information.

14. (Currently Amended) A projector comprising:

a projection section which projects an image into a projection area;

a sensing section which outputs sensing information obtained by sensing a projection area into which light of a distortion-free and predetermined shape is projected from a virtual view position, from a projection position of ~~a-the projection section for projecting an image;~~section;

an area extraction section which extracts coordinates of the light of the predetermined shape in a sensed area, based on the sensing information; and

a keystone distortion correction section which converts the coordinates of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into the projection ~~coordinates;~~ and coordinates.

~~the projection section.~~

15. (Original) A portable device comprising:

a sensing section which senses a projection area on which an image is projected;

a histogram generation section which generates histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on sensing information obtained by the sensing section;

a direction determination section which determines direction information based on an angle between a normal direction orthogonal to the projection area from a sensing position and a projected image direction toward a central portion of the projected image from the sensing position; and

a transmitter section which corrects keystone distortion of the projected image, based on the histogram information and the direction information, and transmitting the histogram information and the direction information to an image display device that projects the projected image.

16. (Original) An image processing method comprising:

sensing a projection area on which an image is projected and outputting sensing information;

generating histogram information that expresses histograms of the numbers of pixels of the sensed image in each of the vertical and horizontal directions, based on the sensing information;

detecting a normal direction orthogonal to the projection area from a sensing position;

detecting a projected image direction toward a central portion of the projected image from the sensing position;

generating direction information, based on an angle between the normal direction and the projected image direction; and

correcting keystone distortion of the projected image, based on the histogram information and the direction information.

17. (Original) The image processing method as defined in claim 16, comprising:

detecting inclination of an image display device;

correcting keystone distortion in the vertical direction, based on the detected inclination; and

correcting keystone distortion in the horizontal direction, based on the histogram information and the direction information.

18. (Currently Amended) An image processing method comprising:

projecting light of a distortion-free and predetermined shape from a virtual view position into a projection area;

outputting sensing information obtained by sensing the projection area into which the light of the predetermined shape is projected, from a projection position of a projection section for projecting an image;

extracting coordinates of the light of the predetermined shape in a sensed area, based on the sensing information; and

converting the coordinates of the light of the predetermined shape in the sensed area into coordinates for projection in a spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into the in the sensed area projection coordinates.

19. (Original) The image processing method as defined in claim 18, wherein the predetermined shape is rectangular or square; and the method including:

extracting coordinates of four corners of the light of the predetermined shape when coordinates of the light of the predetermined shape in the sensed area are extracted; and converting the coordinates of the four corners of the light of the predetermined shape in the sensed area into coordinates for projection in the spatial light modulator of the projection section, and correcting keystone distortion by mapping coordinates of an input image into an area formed by the projection coordinates of the four corners, when the keystone distortion is corrected.